

IN THE CLAIMS:

Please amend claims 1, 14, 16, 18, 35, 42, 45, 50, and 52 as set forth on the enclosed sheets.

REMARKS

In view of the Examiner's determination that the effective filing date for the claimed invention is June 27, 2000, applicants have deleted the "Cross Reference to Related Applications" on p. 1 of the specification.

Claim 42 has been amended to render it more definite as suggested by the Examiner.

Claim 18 was rejected as being obvious over U.S. Patent No. 6,122,023 to Chen even though the Examiner admitted that Chen does not explicitly show a housing having a display surface on which an image is projected. The Examiner reasoned that it would be obvious to incorporate a display surface on Chen's housing.

Yet, to do so, is contrary to Chen's disclosure. Chen discloses a liquid crystal screen 30 (Fig. 2) which is connected to a high frequency, low voltage source 38 which "vibrates" the screen 30 (col. 4, line 37). The screen must vibrate during use as a display in

order to eliminate speckle interference in the displayed image. A vibrating screen would not be incorporated in a hand-held, portable source 52 as the Examiner proposed, because a vibrating screen is incompatible with a hand-held device. Indeed, that is why Chen shows the vibrating screen to be remote from the source 52 in Figs. 4 - 5 and never suggests that the screen could be located on the device itself.

Nevertheless, to expedite prosecution, claim 18 was amended to recite that the display surface is stationary on the housing during the display mode. Allowance of amended claim 18 is respectfully requested.

Independent claims 1 and 14 were rejected as being obvious over U.S. Patent No. 5,600,121 to Kahn in view of IEEE. The Examiner regarded the “aiming mode” of Kahn to be the equivalent of the applicants’ claimed “display mode.”

As the Examiner will note upon reviewing Kahn, during the aiming mode, “a point or a line” is produced on the symbol to be read (col. 10, lines 14-15). This is not the same as applicants’ claimed “bit-mapped” image and, to expedite prosecution, applicants have amended claims 1 and 14 to recite that the bit-mapped image is also “two-dimensional,” thereby distinguishing the aiming mode from the display mode.

The combination of Kahn and IEEE is not believed to be proper. First of all, Kahn uses a two-dimensional, solid-state imager 26 to scan a symbol, whereas IEEE uses two rotating scan mirrors to scan a target. More importantly, neither reference projects a two-dimensional image. Kahn, as noted above, only projects a point or a line. IEEE does not project anything and, indeed, specifically states at p. 71, right column, that it does not want to project images, but instead, wishes to directly capture an image on film. Allowance of claims 1 and 14 is respectfully requested.

Independent claims 16, 35 and 45 were also rejected by Kahn in view of IEEE. In addition to the above arguments given for claims 1 and 14, claims 16, 35 and 45 recite that the light source or laser is energized and deenergized on and off during sweeping of the light beam over each of the scanning lines to create the two-dimensional image. Neither Kahn, nor IEEE, teaches the energization or deenergization of a light source. At best, Figs. 7 and 9 of IEEE disclose an acousto-optic (AO) modulator in the path of the laser beam emitted by a laser. The modulator, however, only deflects the laser beam; it does not energize or deenergize the laser. Allowance of claims 16, 35 and 45 is respectfully requested.

Independent claims 50 and 52 were also rejected by Kahn and IEEE in further view of Chen. Each of claims 50 and 52 was amended, in a manner similar to claim 18 above, to recite that the display surface is stationary during display of the image to better distinguish

over Chen's vibrating display. Allowance of claims 50 and 52 is respectfully requested.

Finally, enclosed for the Examiner's approval is a marked-in-red copy of Figs. 12 and 13 in which errors by the draftsmen were corrected.

Wherefore, a favorable action is earnestly solicited.

Respectfully submitted,

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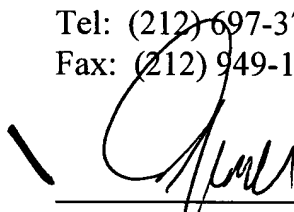
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MARKED-UP VERSION OF CLAIMS 1, 14, 16, 18, 35, 42, 45, 50, and 52

1. A portable instrument for projecting a bit-mapped two-dimensional image in a display mode of operation, and for selectively electro-optically reading indicia in a reading mode of operation, comprising:

- a) a housing;
- b) an electro-optical assembly supported by the housing, for reading the indicia during the reading mode, and for projecting the bit-mapped two-dimensional image on a viewing surface during the display mode; and
- c) a mode selector for selecting one of the modes.

14. A method of projecting a bit-mapped two-dimensional image in a display mode of operation, and of selectively electro-optically reading indicia in a reading mode of operation, comprising the steps of:

- a) manually selecting the reading mode on a portable instrument for reading the indicia; and
- b) manually selecting the display mode on the portable instrument for projecting the bit-mapped two-dimensional image on a viewing surface.

16. An electro-optical assembly for projecting a bit-mapped two-dimensional image in a display mode of operation, comprising:

- a) [a] an energizable light source for generating a light beam when energized;
- b) a scanner for sweeping the light beam in a raster pattern of scanning lines that cover an area of a viewing surface, and

c) a controller for [pulsing] energizing and deenergizing the light source on and off while the light beam is swept over each of the scanning lines to create the image.

18. A portable, handheld device for displaying a bit-mapped two-dimensional image, comprising:

a) a housing;

b) [having] a display surface on the housing; and

[b] c) a projector within the housing for projecting [an] the image on the display surface in a display mode of operation, the display surface being stationary on the housing during the display mode.

35. An arrangement for displaying [an] a bit-mapped two-dimensional image for viewing by a human eye on a target, comprising:

a) an energizable laser for projecting a laser beam toward the target when energized;

b) a scanner for sweeping the laser beam along a plurality of light paths over the target; and

c) a controller operatively connected to, and operative for energizing and deenergizing, the laser while the laser beam is swept along the light paths, the controller being operative for energizing the laser at selected positions of the laser beam in at least one of the light paths to [generate] illuminate individual light pixels at the selected positions, and at a refresh rate at which the pixels persist to enable the eye to steadily view the bit-mapped two-dimensional image, the controller being operative for deenergizing the laser at other selected positions of the laser beam in at least one of the light paths to non-illuminate individual light pixels at the other selected positions, the image being comprised of a light pattern of the illuminated and non-illuminated pixels on the target.

42. The arrangement of claim 36, wherein the first scan mirror is moved at a first rate of speed through a first angular distance, and wherein the second scan mirror is moved at a second rate of speed slower than said first speed, and wherein the second scan mirror is moved through a second angular distance greater than said first angular distance.

45. A method of displaying [an] a bit-mapped two-dimensional image for viewing by a human eye on a target, comprising the steps of:

a) providing an energizable laser to project a laser beam toward the target;

b) sweeping the laser beam along a plurality of light paths over the target; [and]

c) energizing the laser at selected positions of the laser beam in at least one of the light paths to [generate] illuminate individual light pixels at the selected positions, and at a refresh rate at which the pixels persist to enable the eye to steadily view the image; and

d) deenergizing the laser at other selected positions of the laser beam in at least one of the light paths to non-illuminate individual light pixels at the other selected positions, the image being comprised of a light pattern of the illuminated and non-illuminated pixels on the target.

50. A hand-held, electronic device for displaying [information] a bit-mapped two-dimensional image, comprising:

a) a housing having a display panel on the housing;

b) an energizable laser in the housing for projecting a laser beam toward the display panel when energized;

c) a scanner in the housing for sweeping the laser beam along a plurality of light paths over the display panel; and

d) a controller in the housing operatively connected to, and operative for energizing, the laser at selected positions of the laser beam in at least one of the light paths to generate individual light pixels at the selected positions on the display panel, and at a refresh rate at which the pixels persist to enable a human eye to steadily view the image comprised of a light pattern of the pixels on the display panel, the display panel being stationary during display of the image.

52. A wearable, electronic device for displaying [information] a bit-mapped two-dimensional image, comprising:

a) a wearable housing having a display surface positioned on the housing in front of a human eye;

b) an energizable laser in the housing for projecting a laser beam toward the display surface when energized;

c) a scanner in the housing for sweeping the laser beam along a plurality of light paths over the display surface; and

d) a controller in the housing operatively connected to, and operative for energizing, the laser at selected positions of the laser beam in at least one of the light paths to generate individual light pixels at the selected positions on the display surface, and at a refresh rate at which the pixels persist to enable the eye to steadily view the image comprised of a light pattern of the pixels on the display surface, the display panel being stationary during display of the image.

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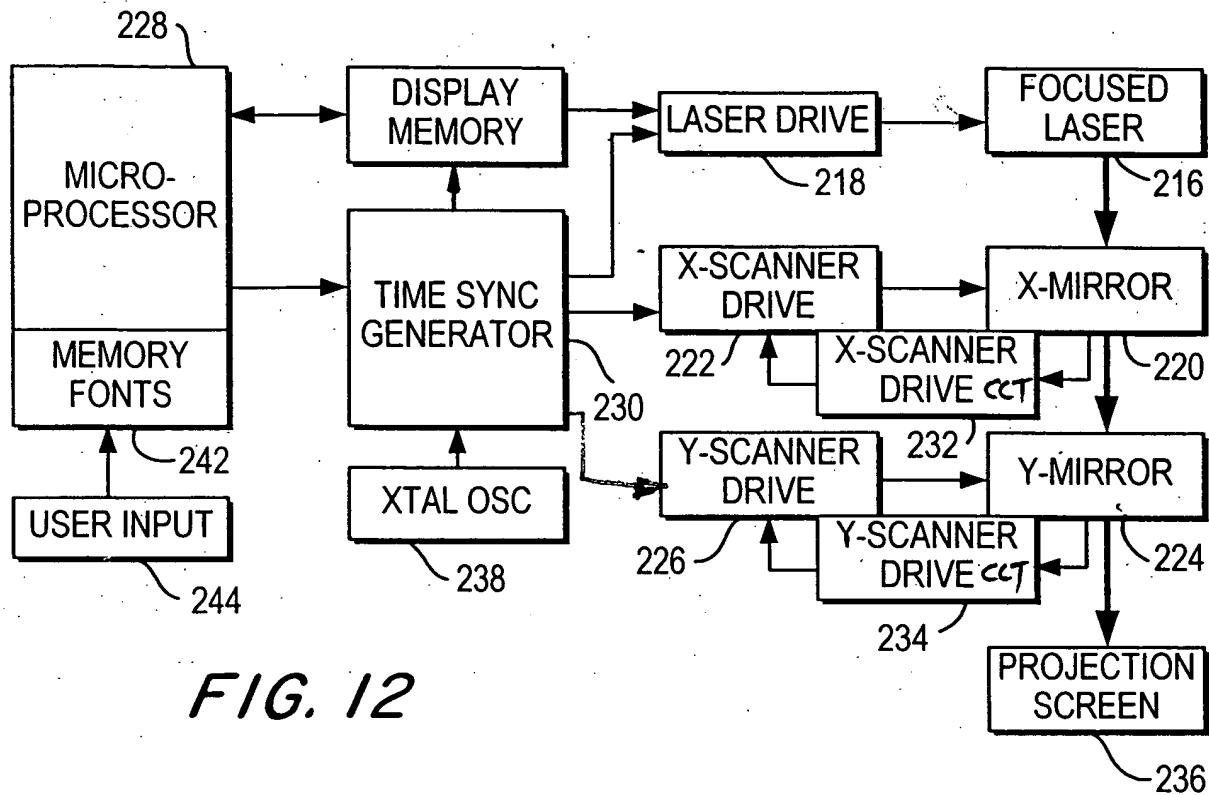


FIG. 12

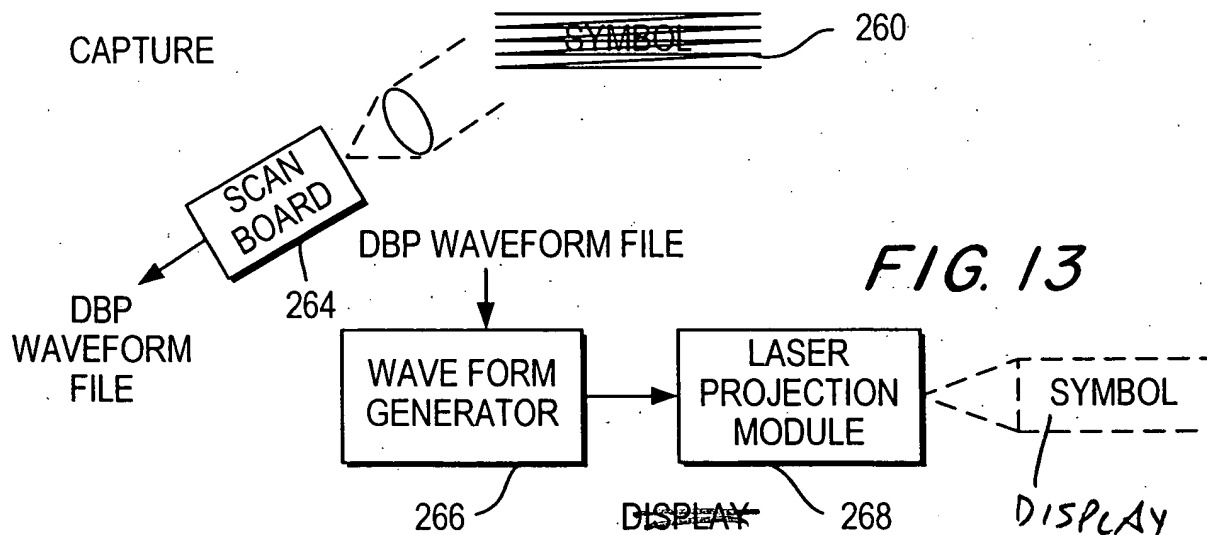


FIG. 13

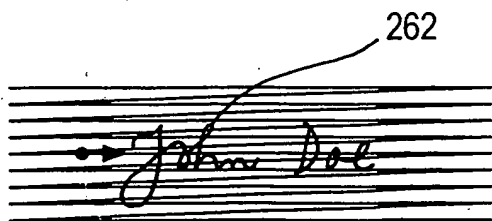


FIG. 14

Drawing Approved
 4/5/04
 RDR